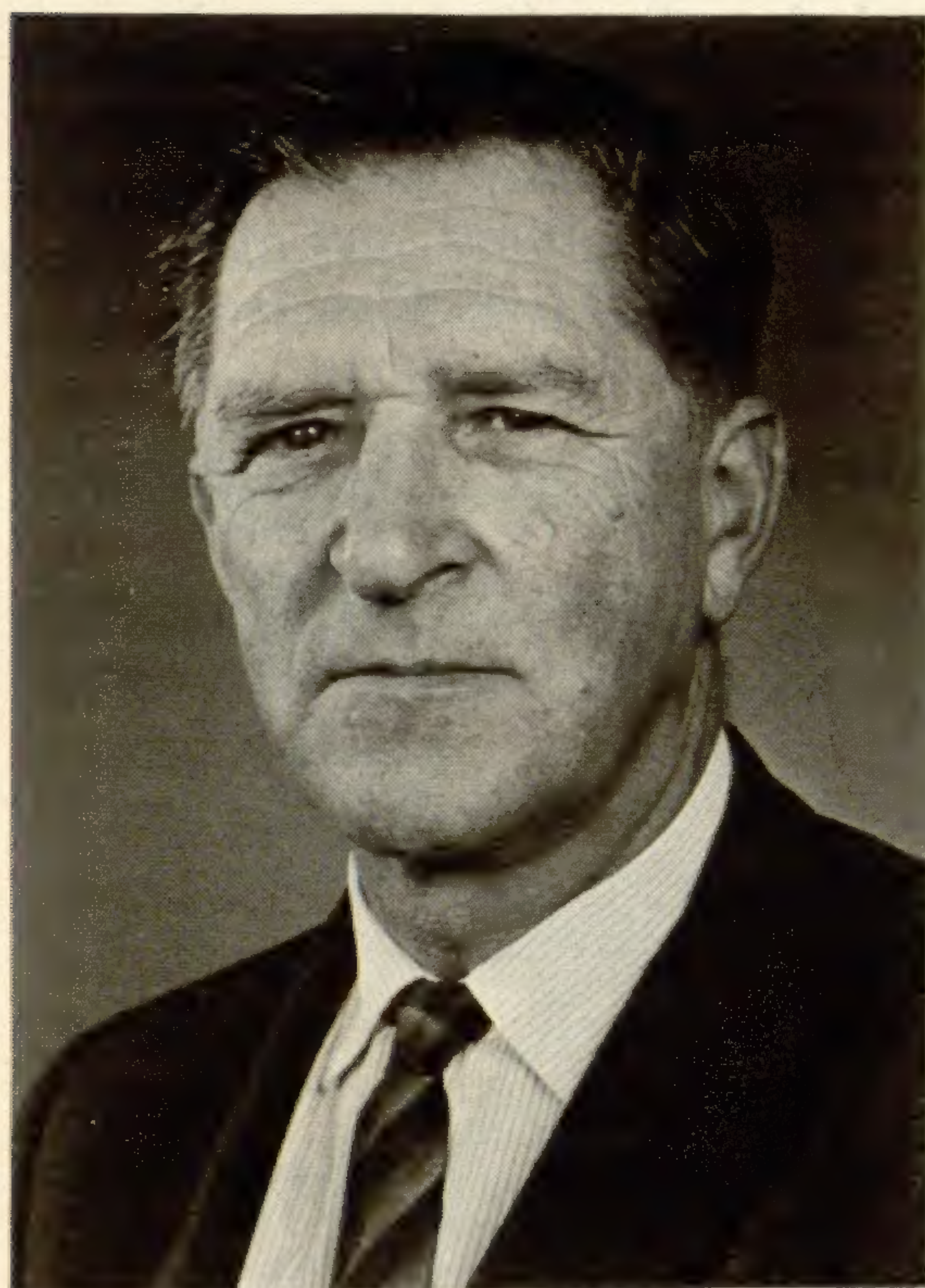


Lasca Leaves



Los Angeles County Department of Arboreta and Botanic Gardens



Dr. Arie Jan Haagen-Smit

HARDLY A RESIDENT of Southern California, and certainly not a single person anywhere who is conscious of our environmental problems, does not associate the name Haagen-Smit with either smog (first to define its chemical composition), the California Air Resources Board (first permanent chairman), or Caltech (faculty member for 40 years), or all three.

Not so many know that this remarkable man, who died of lung cancer last March 18 at the age of 76, did his early work at Caltech in the field of plant physiology, an area in which he maintained a working interest as studies of the damage-absorption relationship between

plants and smog expanded. Because of this interest and because plant-smog studies were being conducted at the Arboretum, he was invited by the California Arboretum Foundation in 1960 to become a member of the organization's Board of Trustees. The invitation was accepted and marked the beginning of a close association with the Arboretum that continued until his death.

Dr. Haagen-Smit served nine years as a member of the Board, two of those years, 1967-69, as its president. After serving the nine-year limit, he was named a permanent honorary trustee. An article he wrote for the June 1969 issue of *Lasca Leaves* reflected the mixture of science, social insight, and humor he brought to his public writings and speeches. This humanistic approach typified the man and produced results at least equal to his laboratory work, namely, the education of the public and the enactment of laws to protect our environment from air pollution.

For his work in the field of air pollution, Dr. Haagen-Smit received many awards. In 1973 he was given the National Medal of Science for his work as head of President Nixon's air pollution task force. Other awards included a \$50,000 Tyler ecology prize, the Smithsonian Institution's Hodgkins Medal, and Western Europe's Rhineland Award. He was elected to the National Academy of Sciences of both the United States and his native Hol-

land. A recent tribute that meant much to him was the unanimous action of the California Legislature in renaming the state Air Resources Board laboratory in El Monte the Haagen-Smit Laboratory. It is here that tests are made of atmospheric conditions and vehicle exhaust emissions. Dr. Haagen-Smit attended the renaming ceremony, and from his wheel chair expressed his gratitude in a speech laced with characteristic humor.

In the past two years he played an important role in matters affecting the Arboretum: he served as chairman of the Council of Advisors for raising funds for the proposed Hall of Environmental Education, and demonstrated his belief in the need to develop a source of natural rubber in this country by recommending that the Arboretum become engaged in studies aimed at increasing the yield of the rubber-bearing shrub, guayule, a recommendation that led to a research grant from the National Science Foundation.

Queen Anne Frolic

IT STARTED IN 1971, has continued every odd year, and has proven itself to be one of the most popular and successful fund-raising events staged at the Arboretum. "It" is the Queen Anne Frolic, the dinner-dance-with-entertainment for California Arboretum Foundation mem-

bers and their guests. This year the date is Friday evening, September 23rd; the fund target is the Hall of Environmental Education.

Frolic chairman Mrs. David Stevenson has provided us with the following information: deadline for reservations is September 12; donations are \$30 a couple, \$15 single. The event will begin at 6 p.m. The typical Frolic atmosphere of a time long past will be established by the Horseless Carriage Club and the Santa Anita Model A Club whose members will drive guests around the grounds in their ancient but

well-preserved vehicles. Paddle boats on Lasca Lagoon and vintage bicycles ridden by members of the High Wheelers will add to the period mood. As always, there will be interior tours of the Queen Anne Cottage, one of the few times each year the 1880s building is opened for public inspection.

Dinner, featuring the by-now famous barbecued beef of Director Francis Ching, will be held in the mall fronting the Cottage, the tables decorated with checkered cloths, candles and flowers. Dancing and entertainment will follow.

Credit for the planning and physical staging of the event is due many persons, says Mrs. Stevenson, but she particularly wanted to mention these members of Las Voluntarias: Mmes. George F. Brock, Jim Quandt, David Malafronte, Leland Larson, Dwight Smith, John Atkinson, Jr., Bruce Eberwine, John Eredia, Peter Norvell, Joseph Coulombe, John Hoffman, and David Roos.

An added touch this year will be a souvenir program which, in addition to the program and credits, will include a list of patrons and sponsors.

Queen Anne Frolic chairman Mrs. David Stevenson, left, with assistants Mrs. David Malafronte and Mrs. Jim Quandt, try out vintage Ford owned by Thomas Grabowski of the Santa Anita Model A Club. Club members will drive guests around the grounds the evening of the Frolic.



David Deardoff

Plant Portraits: The Silk Oak

Grevillea robusta

IN THE CONTINUAL search for uncommon house plants, people have explored the possibilities of using young trees. Among the few trees which can successfully be grown indoors is the silk oak, *Grevillea robusta*. Its chief attraction as a house plant is its evergreen, fernlike leaves, which are dark green above and silver-white on the undersurface. Only seedlings are grown indoors and they grow rapidly, soon becoming large specimen plants. They grow too large for indoor use in a year or two, but since the seeds germinate readily, it is easy and certainly worth the modest effort to start new plants each year. In areas of mild climate, such as Southern California, young trees may then be planted out in the landscape where they are valued for their springtime display of brilliant orange flowers.

Aside from its usefulness as a houseplant and as a landscape tree, the silk oak was at one time a valuable source of cabinet wood. In fact, it is because of the characteristics of its wood that it was given the common name of silk oak. In the early 1800s, lumbermen around Moreton Bay in Queensland noticed that the wood of *Grevillea robusta* greatly resembles English oak in the color and pattern of its grain but when newly cut has a definite sheen or silkiness which English oak does not have. From this the loggers named it the silky oak (usually called silk oak outside of Australia). The beautifully patterned wood was widely used for furniture, indoor fittings, and coach building. It was also used for barrel staves due to its elasticity and its reported capacity to hold nails well. As more and more of the trees were logged, the natural populations were decimated, and the wood of a different tree, *Cardwellia sublimis*, is now marketed as silk oak. *Grevillea robusta* is in no great danger of extinction, however, since it is





A single, finely-dissected leaf (a); fruits (b); inflorescence of numerous small flowers (c) showing closed (arched style) and open (erect style) flowers of *G. robusta*. Photo by William Aplin

widely cultivated as a landscape tree and houseplant in many areas of the world, including its homeland.

Despite its common name, the silk oak is not closely related to true oaks at all. It is a member of the Proteaceae, a family of plants named after Proteus, the sea god who was able to change his form at will, thus alluding to the baffling diversity of species. It is a family of some 1400 species of trees and shrubs (rarely herbs) and includes such well known ornamentals as *Protea*, *Grevillea*, *Hakea*, *Stenocarpus*, and *Macadamia ternifolia*, the macadamia nut tree now widely grown in Hawaii (representatives of each of these genera may be seen at the Los Angeles State and County Arboretum). The members of this family occur naturally in dry regions of the southern hemisphere only, particularly South Africa and Australasia, with a few representative in South America. Many are highly ornamental because their flowers are borne in large clusters, are often brilliantly colored, and have a very unusual structure. The distinctive structure of the flowers is shared by all members of the family. The Proteaceae, like many other families which have a relatively uniform floral morphology, appears to be isolated and its evolutionary affinities are often subject to debate among

botanists. Some botanists believe the Proteaceae has no living close relative while others, on the basis of the structure of the peculiar flowers, consider it related to the Elaeagnaceae.

THE MEMBERS of the Proteaceae have flowers which have no petals at all. The colorful part of the flower is the four sepals (which look like petals). The four stamens are fused to the sepals opposite the lobes, and the sepals are fused into a perianth-tube or hypanthium. The ovary is simple (composed of a single carpel) and is often borne on a short stalk or stipe. In *Grevillea* the perianth tube is split down one side and curves down and away in a tight spiral. Before the flower is fully open the style arches up and out of the slit in the perianth but the stigma is held securely in the pouch-like tip of the perianth and is surrounded by the pollen-bearing anthers. The anthers shed their pollen before the stigma is released from its pouch. Thus, when the flower is fully open and the stigma is released, it already has pollen on it. The stigma is not receptive at this time and pollination and fertilization (followed by the production of seeds) usually do not occur until

a bird visits the flower in search of food. When the bird inserts its beak into the flower to obtain nectar, the stigma touches the bird's forehead and deposits its pollen there. As the bird flies from plant to plant it carries pollen on its head ensuring effective cross-pollination and the production of seeds.

The relationship between the plant and the bird is somewhat mutualistic because both organisms benefit from the relationship. The bird receives food (nectar) provided by the plant while the plant is assured of reproductive success. A classic example of this kind of relationship is provided by one of the South African sugarbirds, *Promerops cafer*, which is completely dependent on flowers of certain species of *Protea* (*P. mellifera*, *P. incompta*, *P. longiflora*, and *P. scolymus*). The bird lives in the same habitat as the proteas, consumes the nectar secreted by the flowers, uses the fluff from the inflorescences to line its nest, and its peak breeding season coincides with the flowering period of the proteas. These birds are unable to adapt to any other food source and, as a result, they are dying out as increasing human population pressure forces agriculture to displace the proteas.

In addition to birds and bees, other animals such as butterflies,

bats, and hawkmoths also visit flowers to feed on nectar. Plants which are specifically adapted to one particular kind of these animals frequently have a syndrome of floral features which attracts that animal to the exclusion of most others.

Many flowers visited by birds, for example, are bright red or scarlet-orange, colors which birds see well and are attracted to. Bird flowers are often long, narrow, and tubular, permitting a bird's beak to reach the nectar, but are often too narrow and deep to allow bees to enter the flower. Another characteristic feature of bird flowers is that they produce copious nectar. The South African proteas are called sugar-bushes or honey-pots because they produce such great quantities of nectar that it is easily collected in containers and consumed by the natives.

Features of the flowers such as color, shape, and the amount of nectar, are effective mechanisms to attract specific pollinators only so long as the plant is growing in its native habitat and has only to contend with animals which evolved in the same region. The precision of the floral mechanism often breaks down when plants (and animals like honeybees) are cultivated in regions other than those to which they are native. Several Australian species of *Grevillea* are cultivated in California at the Los Angeles State and County Arboretum. Many of these species are adapted to pollination by honey-eaters and spine bills, birds which are well represented in Australia but which do not occur in California. Honeybees, originally native to Southeast Asia, are also cultivated in California and visit several species of *Grevillea* in large numbers. However, the honeybees are too small to effectively pollinate the flowers and so are essentially robbing the plant because they consume the nectar provided by the plant and give nothing in return.

Apparently there are few species of bees in Australia to compete with the birds for nectar. Thus, *Grevillea* species have probably never had to cope with nectar-robbing bees before and have not evolved burglar-proof flowers. Interestingly, hummingbirds, which are found only in the New World, also visit *Grevillea* in California and seem to be very effective pollinators. Were it not for the hummingbirds, some species of *Grevillea* cultivated in California would not be able to reproduce.

The silk oak rarely flowers when grown indoors, but mature trees grown outdoors are capable of producing a grand spectacle in springtime. Flowering is often erratic, however; in some years there may be a glowing spire of yellow-orange flowers, in others there may be only a few. The tree may drop its leaves before flowering, especially during dry periods, and the flowers are then even more conspicuous. It does not bloom as well along the coast as it does inland in hotter, drier areas.

THE SILK OAK does not get as tall in cultivation (50 to 60 feet) as it does in the wild (to 150 feet) but it should never be planted under transmission wires. A fast-growing shade producer, it is a good temporary tree to fill in for a slower growing, and sturdier species. It may also be used as a quick, tall screen, or clipped as a hedge. It will tolerate a fair amount of water if the soil is fast draining, otherwise it should be kept on the dry side (do not plant it in a lawn), and will thrive in poor and compacted soil. As a house plant, the silk oak does best in filtered light and cool temperatures (50-60°F). It requires ample water and good drainage. Any standard potting soil will suffice. Young trees planted outdoors may show some damage at 24°F; older trees are hardy to 16°F.

The only serious fault of the silk

oak is its brittle wood. It is easily damaged in high winds and is not a good street tree unless the structure of the tree is strengthened by judicious pruning when it is young. Although it is evergreen, it has a habit of dropping a few leaves throughout the year. This is more of a nuisance than a fault, but this habit and its brittle wood diminish its usefulness and may relegate it to out-of-the-way areas. It has also been identified as the causative agent in some cases of contact dermatitis.

Several very large specimens of *Grevillea robusta* may be seen on the grounds of the Los Angeles State and County Arboretum. There are three large trees in the Australian section (C7) which have flowering branches close enough to the ground so that the curious flowers may be observed at close range. Although individually the flowers are small, they are sometimes produced in such abundance that the entire tree glows yellow-orange from a distance. The color of the flowers contrasts beautifully with the dark green foliage and can be striking when combined with a blue flowering tree such as *Jacaranda acutifolia*. Although the silk oak is perhaps too large and its wood too brittle to permit planting it in small gardens close to walks and houses, its tolerance of drought, poor soil and neglect, along with its occasionally spectacular floral display, are valuable features which should not be ignored. Ornamental plants which consume little water are almost certain to play a larger role in the future of horticulture in Southern California, especially if the drought we are currently experiencing becomes more severe and water rationing becomes imperative.

Dr. Deardoff is a member of the Department research staff involved in taxonomic studies.

Descanso Gardens: The Verdugo Years

II

ONCE AN OBSCURE part of the vast landholdings of the Verdugo family, today's Descanso Gardens was legally wrested from the family in 1843. Overriding the protests of Julio Verdugo, a triumphant Don Ignacio Coronel secured title to the northernmost reaches of Rancho San Rafael, a tract he called "La Canada atras de Los Verdugos," (the glen behind the Verdugos), or more familiarly, Rancho La Canada. Occupation of the area by the Coronel family was to be short-lived, however. As the first La Canada settlers, they were beset with difficulties from the start, a good part coming from the depredations of marauding Indians. At the end of four years of trying to make Rancho La Canada a productive enterprise, the family left, selling the deserted land a few years later to two American lawyers for \$700 plus legal fees.

The troubles at Rancho La Canada had resulted, in large measure, from the uncertainties that plagued all of Southern California during the late 1840's. At loggerheads for years, the United States and Mexico formally declared war in 1846, and, though California was only minimally involved in the actual fighting, the political implications of the struggle assumed great importance. By the Treaty of Guadalupe Hidalgo in 1848, California (as well as Texas and most of the Southwest) was ceded to American control. That

same year, gold was discovered at Sutter's mill, and Americans descended on the newly acquired territory in droves. California was rushed into statehood by 1850, and, suddenly, resident Mexican rancheros found themselves not only under a new flag, but faced with a set of constitutional laws (written in a foreign language) of which they had neither knowledge nor the temperament to cope with.

By terms of the Treaty of Guadalupe Hidalgo, the United States government was pledged to recognize "legitimate titles to every description of property, personal and real, existing in the ceded territories." The burden of proving the validity of property titles, however, lay with the claimer, and in 1852 a specially appointed American Land Commission began hearing cases at its San Francisco headquarters (all California titles held under Spanish or Mexican grants, under penalty of outright forfeiture, had to be submitted to the Board for verification within two years). American lawyers, such as Jonathan Scott and Benjamin Hayes, took on significant roles during this trying period, for the process of collecting documents of proof, gathering witnesses, and presenting a coherent case before the Commission was a time-consuming and legally complex undertaking. It was also expensive, and therein lay a major root of the miser-

ies that beset and finally broke the "rancho system" and most rancheros in California.

Lawyers Scott and Hayes, as owners of Rancho La Canada, filed an early claim of verification with the Land Commission and were duly rewarded in 1855 with confirmation of a 5,832.10-acre Mexican grant (the actual patent was not issued until 1866). The official grant boundaries, apparently smaller than those of the original Coronel claim, no longer included the Verdugo Woodlands nor much of the San Rafael Hills. The new southern boundary line, in fact, was defined in court records as "commencing forty varas from the Old Mission Road (which ran northwest from Mission San Gabriel to Mission San Fernando roughly along, or just south of, today's Foothill Boulevard) and at an Oak tree (the now fallen Verdugo Oak, long a Descanso landmark)." The grant line, in short, bisected today's Descanso Gardens, placing one part of the acreage in Rancho La Canada and the remaining section in the Verdugo's Rancho San Rafael.

Julio and Catalina Verdugo, through their American lawyer, Joseph Lancaster Brent, had secured confirmation of their Rancho San Rafael title (36,403 acres) in September, 1855, and two years later survived a costly U.S. District Court appeal of the Commission's judg-

ment. In 1858, Julio, for variously interpreted reasons, moved to reunite the San Rafael and La Canada acreages, and Jonathan Scott (who had bought out his partner Hayes' half interest) agreed to an exchange of property—to wit, 4,600 acres of the western section of San Rafael (most of today's Burbank) for Scott's Rancho La Canada. In 1861, the aging Catalina Verdugo received control, in theory, of the northern section of the reunified rancho, and she did, in fact, live out her remaining ten years with her nephew Teodoro (Julio's son) in a home in Verdugo Canyon. That Catalina's half rights were forever tied to her brother's wishes, however, was a commonly acknowledged point of fact. And it was a fact, unfortunately, that was shortly to have dire repercussions.

READY MONEY had long been a precious commodity in colonial California (hence the evolution of the bartering hide and tallow trade), but until American takeover, the chronic lack of cash was of no great significance. With statehood, however, came an array of cash obligations, headed by property taxes and lawyers' fees, that produced first outrage, then panic, and often ruin for struggling rancheros. By 1856, the lucrative sale of cattle to northern gold miners had dwindled; "business has stepped out and the people is asleep," wrote the editor of the *Los Angeles Star*. As cash income declined and debts steadily mounted, "most of the native rancheros," to quote historian Robert Glass Cleland, "fell prey to every financial ill and questionable practice of the time. Short-term mortgages (secured by property far in excess of the value of the loan), unconscionable interest rates, and deficiency judgments that stripped the defaulting debtor of his last *real*,



Commemorative plaque at Descanso Gardens.

Photo by William Aplin.

eventually took from even the wealthiest and most distinguished of the native California families, first their herds of cattle, then their broad leagues of land, and finally the friendly shelter of their simple adobe casas."

Julio Verdugo was no exception to this pattern. In 1861, faced with back taxes, but wanting seed and provisions plus building materials for a new house, the unsuspecting ranchero borrowed \$3,445 from Los Angeles merchant Jacob Elias and secured the loan with a lien on his properties (the Verdugo lawyer, Brent, had just left Los Angeles to become a General in the Confederate Army and was, thus, unavailable for consultation). Merchant Elias' ruinous three per cent per month interest rate was compounded quarterly, but the loan was compounded even more decisively by a two-year drought that struck California al-

most before the ink was dry on the Verdugo mortgage. "Thousands of carcasses strew the plains in all directions," wrote one observer. "Famine has done its work and nothing can now save what few cattle remain on the desert California ranches." The statistics bear him out; in the decade from 1860 to 1870, the number of cattle in Los Angeles County dropped from 70,000 to 20,000, a loss of over 70 percent.

Julio Verdugo was not the only man unable to pay his debts in the face of this economic disaster, and the poignant story of his fall was repeated with different names throughout the state. Jacob Elias sued to recover his money, a sum unbelievably inflated by eight years of interest and interim court costs to \$58,750. Completing the ignominy, a legal battle to disassociate half of the acreage from the mort-

gage since Catalina Verdugo had not signed the original loan, failed in its final appeal to the California Supreme Court, and, on March 9, 1869, both Ranchos San Rafael and La Canada were put on the auction block.

Alfred B. Chapman, son-in-law of Jonathan Scott, purchased the combined 42,235 acres for the amount owed on the loan (just over \$1 an acre), but he soon discovered that the legal complexities of the property dissolution were far from over. Numerous claimants, with various conveyances of credit and title (accrued through years of Verdugo fundraising and debt-paying), appeared on the scene to challenge Chapman and others to whom he had sold parcels of land. District Court Case No. 1621 (November, 1871) was eventually necessary to settle the matter, and its conclusions have been appropriately labelled "The Great Partition." The vast Verdugo acreage was divided thirty-one ways

in that year, from tiny slices for several family members (including Julio Verdugo's 200-acre homesite) to sizeable chunks such as Catalina and Teodoro's 2,600-acre Verdugo Woodlands tract. The largest parcels, however, were removed forever from Verdugo hands; Catalina died in 1871, Julio in 1876, and Teodoro in 1904, all on bits of family acreage, but none with the wealth and family prestige of the pre-American days.

Alfred Chapman and his law partner, Andrew Glassell, emerged from the partition with the 5,832-acre Rancho La Canada intact and with their previous San Rafael sales, such as Benjamin Dreyfus' 8,500 acres, basically unencumbered. The Descanso Gardens site remained, at this juncture, on the southern La Canada boundary line, part of it on the Chapman-Glassell property and the rest now on Dreyfus' newly acquired San Rafael acreage. Succeeding years brought a gradual influx of

settlers to both the areas, slowly carving the land into today's homesites and housing subdivisions. Physical isolation and lack of a reliable water source at first retarded urban development; however, much as it had in the earliest days of ownership, and well into the twentieth century, the La Canada Valley remained an agricultural enclave spotted with unimproved tracts. In 1937, newspaperman Elias Manchester Boddy bought one of those unimproved tracts, 125 acres of brush, briars, and poison oak (from the original La Canada section). He added forty acres (from the Dreyfus partition) two years later, and, on the combined acreage, set for himself a beautification program that has culminated in the horticultural success story today called Descanso Gardens.

Sandy Snider is the Department historian.

CALENDAR

JULY, AUGUST, SEPTEMBER

ARBORETUM, Arcadia

JULY 2, 3, 4 — 9 to 5 p.m.

Cactus and Succulent Show
Presented by San Gabriel Cactus and Succulent Society

**JULY 30,31 — Sat. 12 to 5 p.m.
Sun. 9 to 5 p.m.**

Begonia Show
San Gabriel Valley Begonia Society

JULY 31 — 10 a.m.

Sunday Morning Walk
"Australian Section"
Gary Wallace, biologist

AUGUST 28 — 10 a.m.

Sunday Morning Walk
"Tallac Knoll-Aquatic Garden"
Dr. Leonid Enari, senior biologist

SEPTEMBER 18 — 2 p.m.

Sunday Afternoon Talk
"Water Conservation"
Kenneth Montgomery, biologist

SEPTEMBER 23 — 6 p.m.

Queen Anne Frolic
Presented by the California Arboretum Foundation for members and their guests

DESCANSO GARDENS, La Canada

JULY 10 — 10 a.m.

Sunday Morning Walk
"Roses"
George Lewis, superintendent

**SEPTEMBER 24, 25 — Sat. 12 to 5 p.m.
Sun. 9 to 5 p.m.**

Bonsai Show
Presented by Descanso Gardens Bonsai Society

SOUTH COAST BOTANIC GARDEN, Palos Verde Peninsula

JULY 2, 3, 4 — 9 to 5 p.m.

Bromeliad Show
Presented by South Bay Bromeliad Associates

SEPTEMBER 25 — 10 a.m.

Sunday Morning Walk
"Aquatic Section"
Edward Hartnagel, ass't. superintendent

CHANGE OF ADDRESS??

If you are planning to move, you can help us avoid any interruption in delivery of your GARDEN magazine by 1) notifying us of your new address no less than six weeks in advance of the next issue, and 2) by asking your post office to forward all your *bulk* mail as well as your first class mail.

Address us: California Arboretum Foundation, 301 N. Baldwin Ave., Arcadia, CA 91106.